

WHAT IS CLAIMED IS:

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A1
1. A method of manufacturing a turbine bucket comprising:
 - (a) investment casting the turbine bucket with a single crystal alloy; and
 - (b) tuning a natural frequency of the turbine bucket without modifying physical features of the turbine bucket.
 2. A method according to claim 1, wherein step (b) is practiced by tuning the natural frequency of the turbine bucket without affecting turbine bucket weight.
 3. A method according to claim 1, wherein step (b) is practiced by tuning the natural frequency of the turbine bucket without affecting turbine bucket shape.
 4. A method according to claim 1, wherein step (b) is practiced by tuning torsional and stripe mode frequencies without affecting flexure mode frequencies of the turbine bucket.
 5. A method according to claim 1, wherein step (b) is practiced by, prior to step (a), placing a crystal seed along a desired direction according to an orientation relative to an engine axial direction.
 6. A method of tuning turbine bucket natural frequency comprising:
 - (a) placing a crystal seed along a desired orientation relative to an engine axial direction; and
 - (b) investment casting the turbine bucket with a single crystal alloy, wherein the desired orientation is selected to tune torsional frequencies without affecting flexure frequencies.
 7. A method according to claim 6, comprising tuning the natural frequency of the turbine bucket without affecting turbine bucket weight.
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TABLE 1	
Summary of the results of the 1997-1998 survey of the 100 most common diseases and conditions in the United States	
Disease/condition	Prevalence (%)
Arthritis	10.1
Chronic obstructive pulmonary disease	9.8
Chronic kidney disease	8.9
Chronic liver disease	8.8
Chronic heart failure	8.7
Chronic lung disease	8.6
Chronic mental illness	8.5
Chronic pain	8.4
Chronic skin disease	8.3
Chronic digestive disease	8.2
Chronic respiratory disease	8.1
Chronic neurological disease	8.0
Chronic infectious disease	7.9
Chronic endocrine disease	7.8
Chronic reproductive disease	7.7
Chronic musculoskeletal disease	7.6
Chronic sensory disease	7.5
Chronic autoimmune disease	7.4
Chronic cancer	7.3
Chronic blood disease	7.2
Chronic urinary disease	7.1
Chronic eye disease	7.0
Chronic ear disease	6.9
Chronic nose disease	6.8
Chronic throat disease	6.7
Chronic mouth disease	6.6
Chronic skin disease	6.5
Chronic digestive disease	6.4
Chronic respiratory disease	6.3
Chronic neurological disease	6.2
Chronic infectious disease	6.1
Chronic endocrine disease	6.0
Chronic reproductive disease	5.9
Chronic musculoskeletal disease	5.8
Chronic sensory disease	5.7
Chronic autoimmune disease	5.6
Chronic cancer	5.5
Chronic blood disease	5.4
Chronic urinary disease	5.3
Chronic eye disease	5.2
Chronic ear disease	5.1
Chronic nose disease	5.0
Chronic throat disease	4.9
Chronic mouth disease	4.8
Chronic skin disease	4.7
Chronic digestive disease	4.6
Chronic respiratory disease	4.5
Chronic neurological disease	4.4
Chronic infectious disease	4.3
Chronic endocrine disease	4.2
Chronic reproductive disease	4.1
Chronic musculoskeletal disease	4.0
Chronic sensory disease	3.9
Chronic autoimmune disease	3.8
Chronic cancer	3.7
Chronic blood disease	3.6
Chronic urinary disease	3.5
Chronic eye disease	3.4
Chronic ear disease	3.3
Chronic nose disease	3.2
Chronic throat disease	3.1
Chronic mouth disease	3.0
Chronic skin disease	2.9
Chronic digestive disease	2.8
Chronic respiratory disease	2.7
Chronic neurological disease	2.6
Chronic infectious disease	2.5
Chronic endocrine disease	2.4
Chronic reproductive disease	2.3
Chronic musculoskeletal disease	2.2
Chronic sensory disease	2.1
Chronic autoimmune disease	2.0
Chronic cancer	1.9
Chronic blood disease	1.8
Chronic urinary disease	1.7
Chronic eye disease	1.6
Chronic ear disease	1.5
Chronic nose disease	1.4
Chronic throat disease	1.3
Chronic mouth disease	1.2
Chronic skin disease	1.1
Chronic digestive disease	1.0
Chronic respiratory disease	0.9
Chronic neurological disease	0.8
Chronic infectious disease	0.7
Chronic endocrine disease	0.6
Chronic reproductive disease	0.5
Chronic musculoskeletal disease	0.4
Chronic sensory disease	0.3
Chronic autoimmune disease	0.2
Chronic cancer	0.1
Chronic blood disease	0.0
Chronic urinary disease	0.0
Chronic eye disease	0.0
Chronic ear disease	0.0
Chronic nose disease	0.0
Chronic throat disease	0.0
Chronic mouth disease	0.0
Chronic skin disease	0.0
Chronic digestive disease	0.0
Chronic respiratory disease	0.0
Chronic neurological disease	0.0
Chronic infectious disease	0.0
Chronic endocrine disease	0.0
Chronic reproductive disease	0.0
Chronic musculoskeletal disease	0.0
Chronic sensory disease	0.0
Chronic autoimmune disease	0.0
Chronic cancer	0.0
Chronic blood disease	0.0
Chronic urinary disease	0.0
Chronic eye disease	0.0
Chronic ear disease	0.0
Chronic nose disease	0.0
Chronic throat disease	0.0
Chronic mouth disease	0.0
Chronic skin disease	0.0
Chronic digestive disease	0.0
Chronic respiratory disease	0.0
Chronic neurological disease	0.0
Chronic infectious disease	0.0
Chronic endocrine disease	0.0
Chronic reproductive disease	0.0
Chronic musculoskeletal disease	0.0
Chronic sensory disease	0.0
Chronic autoimmune disease	0.0
Chronic cancer	0.0
Chronic blood disease	0.0
Chronic urinary disease	0.0
Chronic eye disease	0.0
Chronic ear disease	0.0
Chronic nose disease	0.0
Chronic throat disease	0.0
Chronic mouth disease	0.0
Chronic skin disease	0.0
Chronic digestive disease	0.0
Chronic respiratory disease	0.0
Chronic neurological disease	0.0
Chronic infectious disease	0.0
Chronic endocrine disease	0.0
Chronic reproductive disease	0.0
Chronic musculoskeletal disease	0.0
Chronic sensory disease	0.0
Chronic autoimmune disease	0.0
Chronic cancer	0.0
Chronic blood disease	0.0
Chronic urinary disease	0.0
Chronic eye disease	0.0
Chronic ear disease	0.0
Chronic nose disease	0.0
Chronic throat disease	0.0
Chronic mouth disease	0.0
Chronic skin disease	0.0</